

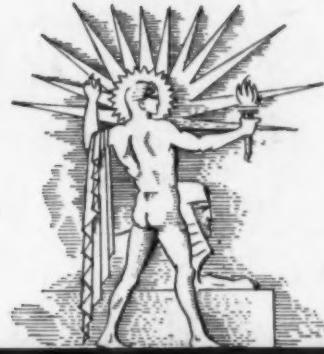
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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE.



June 28, 1941

Antarctic Royalty

See Page 405

A SCIENCE SERVICE PUBLICATION

Do You Know?

Tuna fish are giant specialized mackerel.

A battleship's range finder contains almost 100 prisms, lenses, and other optical parts.

By steam cleaning and lacquering old tin cans, Switzerland finds it possible to re-use those not dented or damaged.

For making drums, Indians prefer a dead tree trunk, with sound exterior but decayed center that can be hollowed easily.

A new synthetic textile from seaweed produced in Britain is cheaper than viscose rayon and has many desirable qualities.

According to current report, Germany's hogs are 15% to 20% fewer now than at the start of war, when they were officially estimated at 24,830,000.

Among the highly trained physicists in the University of California's atom-smashing Radiation Laboratory is a Chinese girl, Dr. Wu Chien-Shiung.

Using smoke signals, Canadian foresters recently recruited three Indians as army volunteers, when ice and bad roads prevented going to an island settlement.

It is well known that European cuckoos lay their eggs in other birds' nests, but an ornithologist now says that each female cuckoo chooses a single type of bird as host, and her eggs tend to resemble those of the nest owner.

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QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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How can you tell time by the stars? p. 407.

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RADIO

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ZOOLOGY

What do weasels feed on? p. 410.

What is the only disease given to man by the dog? p. 410.

RADIO

Thursday, July 3, 2:45 p.m. EST
On "Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Charles A. Federer, Jr., editor of *The Sky* and secretary of the Amateur Astronomers Association, will discuss "that hobby of astronomy."
Listen in each Thursday.

The West Indian seal is unusual because it is a warm water seal.

Australia has completed construction of its National Standards Laboratory at Sydney.

Government engineers have perfected a single-wheeled trailer outfit to measure road smoothness.

Apples mentioned in the Bible were probably the fruit we know as apricots, in the opinion of some botanists.

Each planet gives out just about the same amount of light and heat that it receives from the sun, and no more.

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ASTRONOMY—GENERAL SCIENCE

Completion of 200-Inch Telescope Is in Sight

One of Its Uses Will Be in Study of Radiation From Planets, Including Invisible Infra-Red Rays

COMPLETION of the great 200-inch telescope to be erected on Mt. Palomar as part of the Department of Astrophysics of the California Institute of Technology is at last in sight, thirteen years after the late Dr. George Ellery Hale convinced the Rockefeller Boards of the feasibility of such an instrument, and obtained funds for its construction.

This was announced by Dr. Max Mason, chairman of the Institute's Observatory Council, to the Pacific Division of the American Association for the Advancement of Science. He revealed

that a major headache, a sagging of the great disk of glass for the big mirror which will collect and concentrate the light of distant stars, had been overcome.

The disk, which is 17 feet in diameter and originally weighed 21 tons before some four tons of glass were removed in grinding, is solid in front, but the back is ribbed, mainly to lighten it. By a system of 36 levers, the mirror is held in the holes formed between these ribs. Both the method of support and the structure of the mirror are new in this instrument.

"The supporting system must operate

so perfectly that no bending of the reflecting surface beyond one or two millionths of an inch will occur as the telescope moves," said Dr. Mason.

"As the surface of the mirror was brought by polishing close to a spherical form it became clear that the disk, when tipped from the grinding table to a vertical position for optical test, sagged slightly under gravity," he confessed. "After months of study, as the polishing continued, this sag was eliminated by installing a system of twenty-four squeeze levers, operated by counter weights, distributed around the rim of the glass, and thus another major '200-inch headache' was cured."

Science News Letter, June 28, 1941

To Study Radiations

WHEN the 200-inch telescope finally does swing into use, one of its employments will be in the study of radiations from the planets, Dr. John Strong, also of the California Institute of Technology, said. Planets not only reflect visible light which they receive from the sun; they absorb and then re-radiate considerable quantities of solar energy, largely in the form of the invisible infra-red rays. These will be caught by the great mirror, and analyzed in a number of specially constructed instruments.

These instruments, Dr. Strong informed his audience, are now being constructed, and the special techniques necessary for their operation are being developed by members of the Institute staff. Much of the information necessary for comparison of conditions on the planets with those on the earth can be obtained only by a more careful and exact study of physical processes taking place on our own planet's surface and in its atmosphere. Determinations, on an entirely new order of exactness, of what happens to earth radiations when they pass through water vapor, carbon dioxide, ozone and the major atmospheric gases, are on the program of research at the Institute.

Incidentally, Dr. Strong pointed out, data obtained in these researches will probably have considerable value to meteorologists as well as to astronomers.

Science News Letter, June 28, 1941

Big, Cool, Red Stars

THE bright star Arcturus, which passes almost directly overhead these



FOR PRECISION

A new white, plastic finish, which will resist the combined attacks of heat, corrosive fumes and humidity, has been developed to protect dials on industrial and military instruments. In a series of tests with the "world's worst weather," created artificially, the new dials remained pure white under the most grueling conditions, while dials of the old type developed yellow splotches and other defects. Accuracy required in electrical instruments makes it necessary to print the marks on the dials with a variance of less than 1/200th of an inch. The young woman worker is mounting the dials at the Westinghouse plant.

June evenings, "is representative of a class of fairly numerous stars, known as K giants, which differ in many ways from the normal, or dwarf stars, like the sun," said Dr. Gustaf Stromberg of the Mt. Wilson Observatory. "They are rather large, having diameters from 10 to 50 times that of the sun and their intrinsic brightnesses are equivalent to from 50 to 500 suns. They are much redder than the sun and therefore have considerably cooler atmospheres."

"The mechanism by which they generate heat must be quite different from that activating the sun and other normal stars, and their evolution may well have followed different lines. They are not in general found in star clusters in or outside the galactic system and seem to be peculiar to our own system, or even perhaps to that part of the system in which we are at the present time. They are quite distinct from the so-called supergiants, which are found in star clusters."

Science News Letter, June 28, 1941

Instrument Shows 'Flames'

RESULTS obtained with a new type of instrument for observing the fiery clouds of prominences in the sun's atmosphere were announced by Dr. Edison Pettit of the Mt. Wilson Observatory. When attached to a motion picture camera prominences have been photographed moving with velocities exceeding 180,000 miles per hour.

Prominences are visible to the naked eye only for a few minutes during a total eclipse of the sun. Otherwise they are visible only with expensive apparatus or simpler devices used at high altitudes. The new instrument, which makes use of polaroid and has no moving parts, can be used with a small telescope at any elevation.

Dr. Pettit stated that "with the new instrument scarlet flames stood out in the atmosphere of the sun with remarkable sharpness, resembling a prairie fire."

Science News Letter, June 28, 1941

Vitamin B₁ Fails

THE STORY of a vitamin experiment that backfired was told to plant pathologists attending the meeting, by Dr. Dean E. Pryor of the U. S. Department of Agriculture. He undertook to test a theory that if cantaloup vines were given doses of vitamin B₁ they would acquire extra vigor and thus become resistant

to the troublesome fungus disease known as powdery mildew. Under both greenhouse and field conditions, the vitamin seemed, if anything, to impart more vigor to the fungus than it did to the vines. From these preliminary results, he concluded, it would seem that the vitamin "offers little possibility for control of cantaloup powdery mildew."

More hope would seem to be found in breeding and selection of strains resistant to the disease, for in experiments which Dr. Pryor carried on jointly with Dr. Thomas E. Whitaker, also of the Department of Agriculture, a number of plants were found that showed no gross signs of the mildew, even in the midst of plantings that were heavily infested. Further search for resistant strains is still going on.

Science News Letter, June 28, 1941

Sea Level Not Level

SEA LEVEL isn't level in the equatorial region of the Pacific ocean. It is two feet higher on the Australasian side than it is on the American, Dr. H. U. Sverdrup, director of the Scripps Institution of Oceanography, declared in his address as president of the Pacific division of the American Association for the Advancement of Science.

As a result of this difference in elevation, there is a narrow, relatively swift current flowing eastward along the equator. If it were not for the friction of water against water, it would move at a rate of about seven knots, said Dr. Sverdrup. Its actual rate is one or two

knots. This, however, is as rapid as the current in a great many inland rivers.

The pile-up of water against the Pacific's western shore results from the action of the trade winds, the speaker stated. Steady winds blowing across the water from the northeast in the northern hemisphere's lower latitudes, and corresponding winds from the southeast in the southern hemisphere, keep two great currents moving steadily westward in the tropical Pacific. Separating them, in the equatorial belt of calms, is the narrow return current, flowing like a river.

This narrow west-to-east equatorial current, however, accounts for only a small part of the water returned across the Pacific. Much larger streams flow away from the equator, to make the return trip at higher latitudes. In the northern hemisphere, the principal returning mass is borne in the Kuroshio or Japan current, which sweeps along the Aleutian chain and turns southward along the North American coast. It is estimated that this current carries more than 5,000 times as much water as the Mississippi.

As described by Dr. Sverdrup, the Pacific is a cold monster with a relatively thin, warm skin. Surface temperatures are quite high, reaching as much as 75 degrees Fahrenheit. But this warm surface layer extends downward only a few hundred feet at most. The great bulk of Pacific ocean water, in the depths, is always cold, most of it only a few degrees above freezing-point.

Science News Letter, June 28, 1941

RADIO

Airplane Locator Probably Uses Altimeter Principle

ADMISSION by Lord Beaverbrook and other British aviation officials that they have a secret radio device for locating enemy planes confirms suggestions that have been made in the United States for some time. Though the nature of the device is not revealed, it is probably some apparatus that uses, in reverse, principles of the radio altimeter.

The ordinary aneroid barometer, commonly used as an altimeter, measures altitude above sea level by showing air pressure, which decreases with height. However, especially when travelling over

mountains, what is more important is the height of the plane above the ground. The radio altimeter sends out a high frequency radio wave, which is reflected from the ground. A receiver on the plane picks up this echo and the time, though a small fraction of a second, is measured. This gives the height.

In the British device, it is believed, the radio beam is sent out, the metal shell of the airplane reflects it, and the receiver detects it on the rebound. Details of one possible way of doing this were revealed last February by the U. S. Patent Office,

when patent number 2,231,929 was granted to Joseph Lyman for a radio airplane locator. The patent was assigned to the Sperry Gyroscope Company, of

Brooklyn, N. Y., which makes control mechanisms for airplanes and ships. (See *SNL*, March 8.)

Science News Letter, June 28, 1941

BIOLOGY

Life and Death Closely Connected With Electricity

Live Tissue Is Like B-Battery and Dead Tissue Like Burned-Out Generator, Engineers Are Told

LIFE and death are very closely connected with electrical activity, Dr. Robert S. Schwab, of the Brain Wave Laboratory of the Massachusetts General Hospital and the Harvard Medical School, told the American Institute of Electrical Engineers.

"In these days of super-sensitive amplifiers and recording apparatus," he said, "it is very tempting to define life and death in terms of electrical activity. Whether or not this concept is accurate, we can, on present knowledge, liken living tissue to a B-battery and dead tissue to a burned-out generator. The function of living tissue, however, is so closely allied with its electrical activity that knowledge of the latter has given us better understanding of the working of the human body."

There are four types of body electrical currents, he stated. One is a small direct current in which the cells act as a B-battery. Second is an alternating current wave that accompanies contraction of muscle tissue. It also occurs in connection with activity of nerve fibers. Third is the type "associated with the more highly developed types of contractile tissue," such as the heart. This is used to operate the electrocardiograph, important instrument enabling physicians to diagnose heart ills.

"The fourth type of body electricity," said Dr. Schwab, "is that associated with the complicated tissue that makes up the central nervous system of animals. Here, as the function is continuous during life, the ganglia and brain cell tissues are ever-active electrically and show no periods of rest in the manner of muscle and nerve. Each brain cell does not actually beat alone, but by a system of interconnections they keep each other stimulated to activity. These 'chains' of neurones make up the bulk of the

brain and spinal cord of man and animals."

The number of possible combinations of neurones, he stated, is represented by the number 1 followed by 2,783,000 zeros, which is greater by far than the number of electrons and other elementary particles in the entire universe, according to astronomical estimates.

These currents require extremely delicate recording equipment, but they show waves of different kinds which have been very useful to physiologists in studying the cells of the central nervous system.

Science News Letter, June 28, 1941

INVENTION

Windshield Protected From Insect Attack

A TRIANGULAR screen of transparent plastic, mounted at the front of an automobile above the radiator grille, diverts currents of air around the sides and above the car. Insects are carried with the air, so they cannot soil the windshield and cause possible danger from obstructed vision. (Henry Mfg. Co., Minneapolis.)

Science News Letter, June 28, 1941

GEOGRAPHY

Emperor Penguins Pictured On Antarctic Expedition

See Front Cover

NAVY photographer Charles C. Shirley of San Diego, Calif., waited six hours on the Bay of Whales in the Antarctic dawn temperature of 20 degrees below zero to secure the beautiful photograph shown on the front cover of this week's SCIENCE NEWS LETTER.

This photograph of the Emperor Penguins is an official photograph of the U. S. Antarctic Service.

Science News Letter, June 28, 1941



POLAR AIRDROME

Like lump sugar are these white building blocks of snow with which a working party are building a winter hangar for the small cabin plane at West Base. The picture, taken at 68 degrees below zero, is an official photograph of the U. S. Antarctic Service.

PHYSICS

Secrets of Living Cells Shown By Electron Microscope

Instrument Will Also Have Use in Industrial Research; Study of Smoke and Dust Facilitated, Fibers Compared

SECRETS of the structure and functioning of the parts of the cells of which all living plants and animals are made may be revealed by use of the electron microscope, which shows details far finer than can be detected with the old-style light microscope.

Speaking before the Pacific Division of the American Association for the Advancement of Science, Dr. A. Marshak, of the University of California, told of some of the biological problems that the new instrument may solve.

"The cell, which is the structural unit of the higher organisms, is itself a highly organized body," he said. "At its surface is a membrane which determines which molecules and ions of the surrounding medium will enter the cell body. It is known to be very selective in its permeability to simple ions. The biologist would like to know whether it has a reticulate or porous structure, whether it has a uniform thin lipid surface or whether it is emulsoid. Different types of indirect evidence have suggested all of these possibilities. What is obviously needed is direct observation."

Other details, too, may be brought out, he said. One of these may tell more about the very important process by which plant cells, with the influence of sunlight, convert carbon dioxide and water into carbohydrates, which are foods for man and beast. Chlorophyll, the green coloring matter of plants, does not show this process, called photosynthesis, when in solution. It does so in the plant cells, where there are chlorophyll-containing bodies called plastids.

"A knowledge of the molecular structure and organization of the plastid may go far in helping us to determine what the photosynthetic unit really is and to understand the photosynthetic process itself," said Dr. Marshak.

Science News Letter, June 28, 1941

For Industrial Research

MANY industrial applications of the electron microscope have already

been found, and others are in prospect, Dr. Otto Beeck, of the Shell Development Company, told the symposium. Among those he mentioned are:

"The investigation of industrial dust and smokes is a problem of sanitary importance.—Knowledge of the actual shapes of the photographic grains and how they are affected by the different developers will possibly revolutionize the photographic industry.—Producers of artificial fibers can compare their product with natural fibers to the most minute details.—The colloid chemist will see directly what he had heretofore to deduce through indirect methods. He will be able to measure particle size and obtain size distributions directly.—The structure of evaporated metal films can be investigated and of late it looks as though we soon shall be able to obtain pictures of the minute details of metal surfaces without the necessity of preparing specimens which are transparent to electrons."

Science News Letter, June 28, 1941

Cadmium from Silver

A FORM of the metal cadmium which gives off radium rays and lasts many weeks is the latest product of modern alchemists who turn one kind of matter into another. The radioactive cadmium is made by bombarding silver with deuterons, or atomic bullets, from the cyclotron, said Dr. A. C. Helmholz, of the University of California.

Science News Letter, June 28, 1941

Light Beam Recorded

IN MANY scientific instruments, the indication is by a weightless light beam pointer. That is, a mirror on the instrument swings, and the beam of light reflected from it moves to indicate the value being measured. To record such a moving beam, it is allowed to fall on a moving band of photographic paper.

However, such a record may now be made directly with a pen, using a device described to the meeting by D. J. Pompeo

and C. J. Penther, of the Shell Development Company, Emeryville, Calif. This has the advantage that the record is obtained without having to bother developing the photographic paper.

What are essentially two photocells, or "electric eyes," are mounted on a moving carriage, which carries the pen. When the light on the two photocells is the same, the carriage is stationary. But as soon as the light swings, one cell receives more than the other, and motors are operated to move it until they are again equally illuminated. In this way the pen follows the light beam, and the pen writes its record on a moving strip of ordinary paper.

Science News Letter, June 28, 1941

AGRICULTURE

Vitamin B₁ in Irrigation Fails to Aid Orange Trees

HEALTHY valencia orange trees, grown under favorable conditions, failed to show any improvement from good to superior when vitamin B₁ and nicotinic acid were added to soil and irrigation water. This was the report of Dr. E. R. Parker and Dr. F. M. Turrell of the Citrus Experiment Station and Dr. James Bonner of the California Institute of Technology on experiments carried on at Riverside.

Young trees were planted in good soil, well drained and aerated. At the time of planting organic matter in the form of peat and dairy manure was added to the fill-in soil and as a surface mulch; the usual procedure.

As the trees grew, vitamin B₁ and nicotinic acid, another factor in the vitamin B complex, were added generously to the irrigation water continually throughout two seasons. Now vitamin B₁ can do remarkable things for humans deficient in the substance. It also stimulates growth in some plants. But healthy young valencia orange trees, according to the scientists, apparently have no use for vitamin B₁ or nicotinic acid.

"It appears," they said, "that vigorous young valencia trees synthesize sufficient vitamin B₁ for their own needs. The vitamin B₁ content of the mature leaves was not affected by any of the soil treatments. In all cases it was higher than that of species of plants which responded to treatment with vitamin B₁. The beneficial effects of the organic matter applied to newly planted trees appear to be due to factors which were not limiting in these experiments."

Science News Letter, June 28, 1941

ASTRONOMY

Sky as a Clock

Using Pointers in Bowl of Great Dipper as Hand And Following Formula To Allow for Season Gives Hour

By JAMES STOKLEY

BEFORE the days of watches, pocket sundials were a popular means of telling time. They were made in great variety, some of precious metals and elaborately decorated, others much simpler, with strict utility in mind. These were very useful in the daytime, and when the sun was shining, but were not much good at night. Accordingly another instrument was used, the "nocturnal," sometimes made in combination with a sundial. A few years ago a modern nocturnal was introduced as a novelty, even though they date back for many centuries.

The nocturnal consists of a disk with a hole in the center, which is sighted on the pole star, in the north. Projecting from the disk is an arm, which is lined up with the pointers, the two stars in the bowl of the great dipper which indicate the direction of the pole star. Then, setting the disk to the time of year, it is possible to read the hour.

However, even without the aid of such an instrument, it is not difficult to read the time from the stars to the nearest half hour, or even quarter hour, using the northern sky as the dial, and the pointers as the hour hand. There is no minute hand to this clock, but that should cause no trouble. The first mechanical clocks had only hour hands, in fact.

If you watch this celestial clock during an evening, you will find that the hand turns counter-clockwise. It makes a complete revolution in a little less than a day. For example, the map for the northern sky shows its position on July 1 at 10:00 p.m., but on July 2 it will be this way about 9:56, on July 3 about 9:52, and so on. Thus, by July 15, the map shows the position for 9:00 p.m. And six months from now, at the same time of the evening, the pointers will be on exactly the opposite side of the pole star.

From the stars we obtain star time, or "sidereal time," which the astronomer uses, but which would be inconvenient for everyday use, since any particular hour would sometimes come at noon, sometimes at midnight. But, for the purpose of finding ordinary time from the pointers, Dr. C. C. Wylie, University of

Iowa astronomer, has worked out the following rule:

Using the pointers as the hour hand of an imaginary clock, read the hour. Thus, if the pointers are directly left of the pole star, read nine o'clock, if they are directly below, read six o'clock. With a little practice, you can read this to the nearest quarter hour. To this figure add the number of months since the beginning of the year, to the nearest quarter month. Double this, and subtract from $16\frac{1}{4}$. If the total is more than $16\frac{1}{4}$, subtract from $40\frac{1}{4}$. Then you have the time in hours p. m. If the number is more than 12, subtract 12, and you have the time in hours a. m. This, of course, is local time, and may differ from standard time, unless you are on the central meridian of your time belt. If you are west of this meridian, it will be earlier than standard time, while if you are to the east it will be later.

Now for an example. On July 15 the pointers may show 7:30, or $7\frac{1}{2}$. You add this to $6\frac{1}{2}$ (the number of months since Jan. 1) which is 14, and double to get 28. Subtracting from $40\frac{1}{4}$, you have $12\frac{1}{4}$, so the time is 12:15, a. m.

Venus made her bow in the evening sky about a month ago. During July she can be seen low in the west in Leo, the lion, just after sunset. The position is indicated on these maps, which reveal the appearance of the heavens at 10:00 p.m. (standard time), in the beginning of the month, and an hour earlier in the middle. Of magnitude minus 3.3, Venus is far brighter than any other star or planet.

Later in the evening Mars can be viewed. Not so bright as Venus, of magnitude minus 0.7, he exceeds any of the stars. Look for his ruddy glow in the east, a little before midnight. Still later—a few hours before sunrise—Saturn, and then Jupiter, swing into view above the eastern horizon. The latter is even brighter than Mars, Saturn is fainter, though still equal to a first magnitude star.

On July 24 Mercury will have moved to its farthest west of the sun. For a few days before and after that date this planet will also be visible, in the east in the morning twilight. It will be about as bright as Saturn.

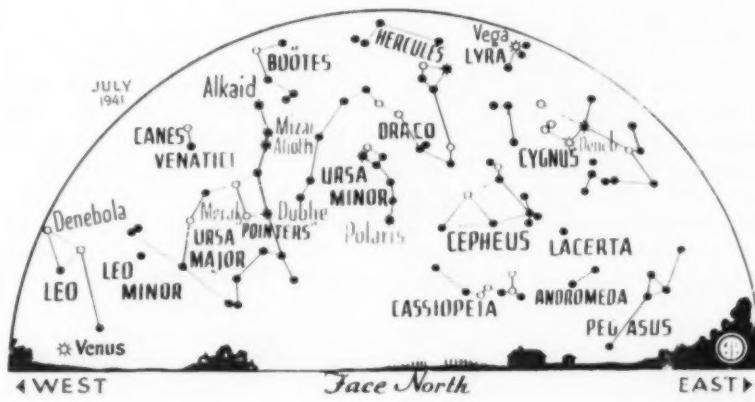
Among the stars of the summer evening, Vega, in Lyra, the lyre, is brightest, shining high in the east. With Deneb, in Cygnus, the swan, and Altair, in Aquila, the eagle, Vega makes a large right triangle of bright stars which is easy to locate. To the northwest is the familiar "great dipper," in Ursa Major, the great bear. Following the curve of the dipper's handle southward, you can find Arcturus, in Bootes, the bear driver, and then, to the southwest, Spica, in Virgo, the virgin.

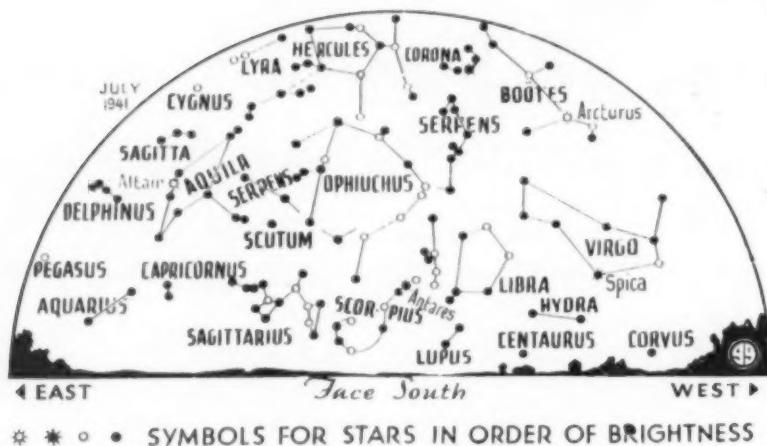
Directly south is Scorpius, the scorpion, with red Antares. This is the last of the six first magnitude stars shown on the maps.

Science News Letter, June 28, 1941

Celestial Time Table for July

Tuesday, July 1, 11:24 p.m., Moon in first quarter. Wednesday, July 2, 7:00 p.m., Earth farthest from sun for year; distance 94,450,000 miles. Saturday, July 5, 9:00 p.m., Moon nearest, 226,700 miles away. Tuesday, July 8, 3:17 p.m., Full moon. Monday, July 14, 8:39 p.m., Moon passes Mars. Wednesday, July 16, 3:07 a.m., Moon in last quarter. Thursday, July 17, 7:00 p.m., Moon





farthest, 251,300 miles away. **Friday, July 18**, 8:14 p.m., Moon passes Saturn. **Sunday, July 20**, 4:13 a.m., Moon passes Jupiter. **Tuesday, July 22**, 11:07 a.m., Moon passes Mercury. **Thursday, July 24**, 2:39 a.m., New moon. **Saturday, July 26**, 8:04 a.m.,

Moon passes Venus. **Monday, July 28**, Early a.m., Delta Aquarid meteor shower. **Thursday, July 31**, 4:19 a.m., Moon in first quarter.

Eastern standard time throughout.

AGRICULTURE—CHEMISTRY

More Tung Oil Production Needed in United States

Imports from China Supply Only Twelfth of Demand And Present Domestic Production Hardly Two Per Cent

RAPID increase in tung tree acreage in this country is urgently needed, W. M. Smith, Jr., technical adviser of the Reasor Tung Plantations, Inc., told the First Annual Southern Chemurgic Conference meeting in Nashville.

The normal annual requirements for tung oil in the United States amount to at least 150 million pounds, and the present imports from China, almost the only source, are supplying only a twelfth of that. Despite the extensive plantings that have been made in this country, present domestic production takes care of hardly 2% of our needs.

Tung trees, which are somewhat sensitive to frost, grow well only in a belt about 100 miles wide along the Gulf Coast, and across Florida to the Atlantic. Fortunately, they require an acid soil, which makes available for tung plantations vast stretches of land that are of little use for other crops. They require plenty of water (40 inches annual rainfall), yet they will not grow in wet soil. Tung planting is not a job for hit-or-miss amateur methods, Mr. Smith emphasized; it requires careful scientific investigation of ecological conditions before

the trees are set out, if the venture is to be a success.

Science News Letter, June 28, 1941

Farm Wealth in Weeds

FARMERS of the future may win wealth from wild plants that are now regarded only as weeds, Wheeler McMillen, president of the National Farm Chemurgic Conference, suggested to the Chemurgic Conference.

Reminding his hearers that there are about 250,000 known species of plants in the world, of which approximately 15,000 are native to the United States, the speaker called attention to the fact that the ones under cultivation number only a few scores, and those are mainly the same as our prehistoric ancestors chose because they could be used just as nature produced them. In modern times great changes have been made in cultivated plants by scientific breeding, yet we have not thought to pick up hitherto uncultivated plants and develop their good qualities in the same way. He urged the appropriation of funds for research in this direction, to

be conducted at state experiment stations.

Science News Letter, June 28, 1941

Farm to Forest

FELLING forests to create new farms, traditional practice in America since earliest times, isn't always the right thing to do, Dr. J. Alfred Hall of the U. S. Forest Service declared. Rather, the process should be reversed on much land which is now being unprofitably plowed year after year, with the farmers only sinking themselves and their families deeper and deeper into poverty.

Dr. Hall took the states of Tennessee and Kentucky as examples for his thesis. When the first settlers came, both states were practically continuous forest. The newcomers ravaged the woods with fire and ax, with no thought for the timber values but only for the soil they could plow and plant after the trees had been cleared.

The result, he said, is that in both states the cut of high-grade lumber is diminishing, with the proportion of lower grade lumber increasing. Men who used to have jobs in sawmills and other wood-using industries have been thrown out of work. Where oak, hickory, chestnut and gumwood used to be a source of pride as well as revenue, there is now a shortage so severe that hardwood lumber is even having to be brought in from the outside.

Science News Letter, June 28, 1941

RESOURCES

Fireworks for Defense Aids Safe and Sane Fourth

DEFENSE production will tend to make this year's celebration of the Fourth of July more "safe and sane" than ever!

With the need for military fireworks, most manufacturing companies are loaded with government contracts. One large maker, producing big display pieces, reports that output for civilian use is now only a third of last year's while that for the Army and Navy has increased three-fold.

Another manufacturer, who makes the big three-inch firecrackers, or "salutes," says that their civil production thus far is only about a third off last year's, but it is falling rapidly, to enable them to take on more government orders. Thus, the 1942 Fourth of July may be almost completely fireworkless.

Magnesium and aluminum, the two

metals that are presenting such a bottleneck in the airplane industry, have much the same role in connection with fireworks. The rockets that you sent up last year, or saw in community displays, bursting to give a brilliant white light, had aluminum powder in them. For military flares magnesium, which is somewhat more expensive but gives a better light, is generally used. Both metals now are hard to get.

Potassium chlorate and potassium perchlorate are two of the most important chemicals used in the pyrotechnic art. They supply the necessary oxygen for rapid burning. Pretty nearly all that is available from the manufacturing chemists is now being employed in the making of government fireworks.

Surprisingly enough, despite the war in China, Chinese firecrackers are still being imported in rather large quantities. Such firecrackers, in bunches, are not made in the United States. However, there is enough of a shortage to make prices, in states where they are still allowed to be sold, considerably higher than in other years.

In the meantime, while defense priorities help to impose a safe-and-sane Fourth on the nation, other efforts toward the same end are continuing. For the fifth year, the American Medical Association has asked hospitals to furnish full data on fireworks injuries.

Largely due to their summaries, it was said is a recent issue of the Association's Journal, "several states have adopted effective anti-fireworks legislation. The number of deaths from this cause has been reduced therefore in 1940 to 8, as compared with 20 in 1937. The total number of injuries has been reduced from 7,205 in 1937 to 4,462 in 1940."

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About 10,000 Army Air Corps officers are to be taught Spanish, the vocabulary being adapted to air corps needs.

One result of Britain's campaign to grow more food has been an addition of a million tons of cereals produced in 1940.

● Earth Trembles

Information collected by Science Service from seismological observatories resulted in the location by the U. S. Coast and Geodetic Survey of the following preliminary epicenter:

Wednesday, June 18, 6:09 a.m., EST

In the ocean centered between Iceland, Greenland and Newfoundland. Latitude, 52 degrees north.

Longitude, 32 degrees west. Strong shock.

For stations cooperating with Science Service, the Coast and Geodetic Survey, and the Jesuit Seismological Association in reporting earthquakes recorded on their seismographs, see SNL, Feb. 22.

PSYCHOLOGY

Here's Recipe for Cocktail Served by Fifth Columnists

British Physician Also Furnishes Prescription as Antidote for Its Mental Poison—Friendliness

AMERICANS who patriotically want to remain sober during the present unlimited emergency will avoid imbibing a cocktail which is the favorite concoction of fifth columnists.

The recipe for this Mickey Finn is exposed by a British psychologist and physician, Dr. Edward Glover, director of the Institute for the Treatment of Delinquency, in a new book, *The Psychology of Fear and Courage*. (Reviewed, SNL, this issue.) It is:

"Take first of all a few hard facts, the news of some reverse or other, if necessary doctored to make it more impressive. (This is to shake our general confidence and make us more receptive to suggestion.)

"Mix it well with a few equally hard facts about class distinction or grievance or hardship. (This is to set one group against another.)

"Add some aspersions on the motives and personal character of the nation's leaders. (This obviously to weaken the leading strings of national feeling.)

"Flavor as required with some good journalistic touches (to make a plausible story).

"Spice with a few threats.

"Serve hot and strong over the radio."

Dr. Glover also offers a beneficial prescription as antidote for the poison in the propaganda cocktail. Anxiety, he says, is essentially a reaction to inner loneliness. The man or the woman or the child who feels that he has no part in an affectionate family or social group falls easy prey to fears and suspicions.

It is to be hoped that America will not have to face the panic-producing situations that have been the almost daily fare in London. But we will undoubtedly have to be alert if we are not to swallow the poison potions of the propagandist and become hysterical victims of the spy mania, the alien antagonism, the fifth-column fever.

Dr. Glover's first remedy is friendliness and neighborliness. Men and women should band together in close groups,

cheered by kindness and mutual association.

If psychological first-aid should be needed for a neighbor actually jittery from too much frightful war news, offer a soothing cup of weak tea, a cigarette. Or if he is of the type who reacts to anxiety as he would to physical shock and needs stimulant, sugar in candy or cake is an excellent restorative as is strong coffee or brandy.

You will find, Dr. Glover assures, that many will be glad to become your patients if you offer this sort of psychological first-aid flavored with pleasant conversation.

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AERONAUTICS

Airplane Manipulation Taught with New Device

PATENTED recently was a device for practicing airplane manipulation. It remains in a fixed position, but as the control stick is operated, and the rudder pedals as well, the pointers on instrument dials connected with them move in a realistic manner. The inventor says that it can be used to develop coordination between the hands and the feet. (Patent 2,243,973, Edward K. Mills, Jr.)

Science News Letter, June 28, 1941

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ZOOLOGY

Monkeys Not Dangerous As Disease Carriers

Placid Cow May Plague Owner with Any of Eight Kinds Of Sickness; Dog Transmits But One—A Serious Disease

MAN'S nearest zoological kindred, the monkeys and apes, are less dangerous to him as disease carriers than are some of the other, more specialized groups of animals. About the only monkey-borne disease that may be transmitted to man is yellow fever, whereas rodents and hooved animals bring him a score or more of maladies, William L. Jellison, U. S. Public Health Service bacteriologist, told the American Society of Mammalogists meeting in Chicago.

Man's closest animal friend, the dog, probably the first animal to be domesticated, is carrier for only one disease, although that is a very serious one—rabies. But the placid cow may plague her owner with any of eight kinds of sickness: tuberculosis, anthrax, foot and mouth disease, undulant fever, actinomycetes, pox, scarlet fever and streptococcus infection. Other illnesses contractable from hooved animals include swine erysipelas, trichinosis, glanders and equine encephalitis. Curiously enough, these troubles are all contributed by domesticated hooved mammals; deer, antelopes and peccaries or wild pigs are not known to carry diseases to human beings.

Rodents and rabbits are bearers of fewer diseases, though some that they do bring us are among the most dangerous of all our ills. The list includes plague, tularemia, spirochaetal jaundice, rat bite fever and one type of food poisoning. Here again it is noticeable that

the biggest score is chalked up to the debit of "domestic" rats and mice—although squirrels and rabbits, as carriers of plague and tularemia, cannot exactly be rated as innocents.

One striking feature, to which Mr. Jellison attached considerable importance, is the fact that animals with a smaller sum-total of bodily specializations than man and the other primates are of no importance as disease carriers, with the sole exception of the rabies-carrying dog. On the other hand, the more highly specialized animals, including rodents, rabbits and hooved animals, are also the carriers of the largest number of diseases.

Science News Letter, June 28, 1941

Trace Yellow Fever

"BRINGING 'em back alive" in large numbers was an important feature in the Rockefeller Foundation's campaign to trace South American jungle yellow fever to its source, Raymond M. Gilmore of the American Museum of Natural History told the meeting. The research program included live-trapping of every obtainable wild mammal species in the area, to determine which of them were capable of harboring yellow fever virus.

Several different types of traps were used, and they had to be placed in trees as well as on the ground. Cebus monkeys were easiest of all animals to catch, because of their inquisitiveness,

greediness and aggressiveness. The same box traps that caught them also often trapped porcupines and opossums. In all, between four and five thousand specimens of all kinds were trapped.

The study disclosed that not only monkeys but opossums are possible reservoirs of yellow fever. Other mammals do not seem to figure.

Likelihood of a species to be a yellow fever carrier was determined by putting its blood through an immunological test. If it showed immunity, it was an indication that the animal had had yellow fever and recovered.

The test could also be used as an index of how recently the fever had been in a given vicinity. If susceptible animals less than two years old had no immunes among them, while older ones showed immunity, it meant that the disease had been there more than two years ago. If no animals of any age showed immunity, there had been no yellow fever in the neighborhood for a long time.

Science News Letter, June 28, 1941

Weasels Feed on Mice

WEASELS in the Big North Woods prefer mice. The second choice is shrews, which are mouse-sized animals that feed on insects (and each other) but are not related to mice. The rest of the weasel diet is scattering, and birds do not figure importantly in it.

These facts, based on studies of the short-tailed weasel in northern Minnesota, were presented before the meeting by Shaler E. Aldous of the U. S. Fish and Wildlife Service and J. Manweiler of the U. S. Soil Conservation Service.

Their figures, representing the contents of a considerable number of weasels' digestive organs, showed that more than half of the carnivores' food consists of mice, about two-fifths of shrews, and the scattering remainder including birds, rabbits, squirrels, porcupines, fish, and even other weasels. It is believed that some of these, like rabbits, porcupines and remains of a wild duck, were carrion finds, for such animals are too large for weasels to attack under ordinary conditions.

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The earliest known bird, *Archaeopteryx*, which lived millions of years ago, probably laid its eggs on decaying tree stumps, instead of building a nest, says one scientist.

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SCIENCE NEWS

BOTANY

NATURE RAMBLINGS by Frank Thone



Poison Preventives

BEST protection against poison ivy, of course, is to know the plant when you see it, and keep away from it. Poison ivy is characterized by compound leaves with three large leaflets each. The margins of the leaves are usually more or less lobed or coarsely notched, though they may be quite smooth and unbroken. The leaves are a rich, glossy green in color.

The plant grows either as a climbing vine, clinging to trees, fences, etc., with myriads of short roots sprouting from its stem, or as a low, sparsely branched shrub springing from a stem creeping along just under the ground surface. Flowers appear in late spring. They are inconspicuous greenish-white clusters, and are followed by small round berries that are white when ripe.

If your work or pastime takes you into places where poison ivy cannot be avoided, you can still escape its ill effects by pre-treating your skin before going into the ivy-infested neighborhood. New-

est preventive is a vanishing cream recommended by the U. S. Public Health Service, which contains either sodium perborate or potassium periodate. This can be mixed by any druggist, using 10% of the sodium compound, or 2% of the potassium periodate. It is rubbed all over all exposed parts of the skin. After four hours it must be washed off with soap and water, and fresh cream put on.

CHEMISTRY

Dressmaker Can Have Dummy Duplicating Her Own Figure

AINvention intended to gladden the heart of home dressmakers: an exact dummy-double of the home sewer's own figure—including every curve and angle—was demonstrated in New York. It can be done in 30 minutes with a new thermoplastic material.

The new type of stand-in, which is said to be unaffected by weather—unlike previous efforts at producing moulded dress forms of its type—was described also as odorless, non-inflammable, non-toxic, and inexpensive.

As demonstrated, the replica of a woman's figure is made by having her don a white cotton shirt over her accustomed foundation garments. Sheets of thermoplastic material made of rubber combined with a variety of waxes are then applied to the figure, moulded to the exact shape. The thermoplastic when cold is rigid, but for the moulding process it is softened by warming it to a few degrees above body temperature by aid of infra-red rays.

If through carelessness or ill luck you do get poisoned, a remedy recommended by Dr. James F. Couch, U. S. Department of Agriculture toxicologist, is a 5% solution of potassium permanganate. Swabbed on the poisoned spots, this oxidizes the toxic substance. It must be used with judgment, however, for it has been known to irritate tender skins. The brown stain left by this treatment can be removed with lemon juice.

Science News Letter, June 28, 1941

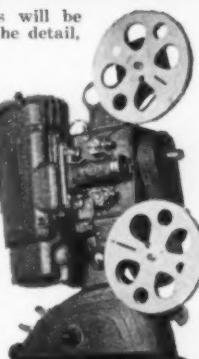
The soft moulded sheath hardens almost at once and one side is re-opened so that the shell can be removed. For strength and permanence the dress form is reinforced and finished with metallic lacquer, and it is mounted on a stand that can be raised or lowered.

Research Laboratories of the Singer Sewing Machine Company, which developed the new sewing aid, said that it represents 10 years of intensive research.

Science News Letter, June 28, 1941

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CORRECTIONS

- Line 7, Martz for Marta
Should read: Assembling presses for use in making machine tools to make weapons for America's defense. Part of new plant built by Austin Co. for Hydraulic Press Manufacturing Co.

- Line 4, Doob for Dobb
Par. 2, line 3, Insert auxiliary after new
Lines 6, 7, 18, Higbee for Higgins
Line 6, 2,227,996 for 227,996
Par. 3, line 2, 11.86 for 5.20
Par. 6, line 3, years for miles
Par. 1, delete last sentence. Par. 3, lines 11, 12, delete with bared fangs. Line 19, to read is also a usual part of
Par. 3, line 5, Gerard for Gerald
Lines 1 and 2, turbine for boiler
Par. 4, line 3, non-colloidal for colloidal

•First Glances at New Books

AERONAUTICS

SIMPLIFIED AERIAL NAVIGATION BY DEAD RECKONING (2d ed., rev.)—J. A. McMullen—*Chemical Pub. Co.*, 96 p., illus., \$2.50. This little book, of British origin, should be useful to the private flier who wants to find his way about in the air.

Science News Letter, June 28, 1941

ENGINEERING

POWER, FROM START TO FINISH—Franklin M. Reck and Claire Reck—*Crowell*, 154 p., illus., \$2. Hero's steam reaction engine, of 200 B. C., is in the first chapter of this fascinating book, U-235 and the possibility of atomic power in the last. In between, steam turbines, windmills, water power and other power sources are discussed. Copiously illustrated, with many unusual pictures, the book is especially timely now when power is so important.

Science News Letter, June 28, 1941

ICHTHYOLOGY

CONTRIBUTIONS TO THE BIOLOGY OF THE PHILIPPINE ARCHIPELAGO AND ADJACENT REGIONS: The Fishes of the Groups Elasmobranchii, Holocephali, Isospondyli, and Ostarophysi, Obtained by the United States Bureau of Fisheries Steamer "Albatross" in 1907 to 1910, Chiefly in the Philippine Islands and Adjacent Seas—Henry W. Fowler—*Govt. Print. Off.*, 878 p., \$1.35 (U. S. National Museum Bulletin 100, volume 13).

Science News Letter, June 28, 1941

NATURE STUDY

NATURE IS STRANGER THAN FICTION—John Y. Beaty—*Lippincott*, 286 p., illus., \$2.50. Short descriptions, most of them only a couple of paragraphs long, of some of the strange things in nature which astonish those who hear about them for the first time, though they are often too readily treated as commonplaces by specialists.

Science News Letter, June 28, 1941

PHYSICS

COMMEMORATION OF THE LIFE AND WORK OF ALEXANDER DALLAS BACHE AND SYMPOSIUM ON GEOMAGNETISM—With the cooperation of The American Philosophical Society, United States Coast and Geodetic Survey, Department of Terrestrial Magnetism of Carnegie Institution of Washington and Girard College—*Amer. Phil. Soc.*, 136 p., illus., \$1.50. Here, gathered in permanent form, are the important papers on the earth's mag-

netism, presented last winter in commemorating the work of a pioneer in that field. (See *SNL*, Feb. 22, 1941.)

Science News Letter, June 28, 1941

PSYCHOLOGY

THE PSYCHOLOGY OF FEAR AND COURAGE—Edward Glover—*Penguin Books*, 128 p., 25c. See page 409.

Science News Letter, June 28, 1941

GENERAL SCIENCE

OUR WORLD AND SCIENCE—Samuel Ralph Powers, Elsie Flint Neuner, Herbert Bascom Bruner and John Hodgdon Bradley—*Ginn*, 653 p., illus., \$1.76. "The study of science should be an adventure rather than a chore. Science is the great adventure of modern times." In this spirit was written this vivid single-volume general science course for the ninth year.

Science News Letter, June 28, 1941

TECHNOLOGY

THE TELEPHONE IN A CHANGING WORLD—Marion May Dilts—*Longmans, Green*, 219 p., illus., \$2.50. The full story of the telephone and the effects that it has had on social and economic life, are contained in this work. Of special interest is the account of all the by-products and side-lines that have come from telephone research.

Science News Letter, June 28, 1941

GEOGRAPHY

THE SOUTH AMERICAN HANDBOOK, 1941 (18th ed.)—Howell Davies, ed.—*Wilson*, 676 p., \$1. In spite of shipping conditions, reports and other data for this edition have come from 23 Latin American countries so efficiently that the editor says no previous edition has been so complete. The handbook serves as a guide, pocket encyclopedia, and even offers hints to travelers about apparel, baggage and so on, and advice to those seeking employment.

Science News Letter, June 28, 1941

ECONOMICS

YOUTH WORK PROGRAMS, Problems and Policies—Lewis L. Lorwin—*Amer. Council on Education*, 195 p., \$1.75. Background of facts, figures and ideas for those interested in carrying forward programs of helping young people to make the transition from school and family-dependence to independent status in the working world. Defense angles of the problem are discussed, and suggestions for improving youth work programs are advanced.

Science News Letter, June 28, 1941

TECHNOLOGY

ARSENAL OF DEMOCRACY, How Industry Builds Our Defense—Burnham Finney—*Whittlesey House*, 284 p., illus., \$2.50. The editor of *American Machinist*, who is in an excellent position to know the facts, tells in this timely book of the problems involved in getting America into gear for defense.

Science News Letter, June 28, 1941

AERONAUTICS—BIOGRAPHY

FAMOUS AMERICAN FLYERS—Chelsea Fraser—*Crowell*, 352 p., illus., \$2.50. A collection of interesting biographical accounts of the famous aviators from the Wright Brothers to Douglas Corrigan.

Science News Letter, June 28, 1941

ELECTRICAL ENGINEERING

PRACTICAL ELECTRICAL WIRING, Residential, Farm, and Industrial (2d ed.)—H. P. Richter—*McGraw-Hill*, 521 p., illus., \$3. Practical methods of electrical wiring, explained in simple language, are given in this new edition, which is based on the 1940 National Electrical Code.

Science News Letter, June 28, 1941

MATHEMATICS

AN INTRODUCTION TO THE THEORY OF NEWTONIAN ATTRACTION—A. S. Ramsey—*Cambridge (Macmillan)*, 184 p., \$2.50. A text for advanced students of mathematics, involving a subject that is important in connection with dynamical astronomy as well as the figure of the earth.

Science News Letter, June 28, 1941

PHYSICS

GIOVANNI MARLIANI AND LATE MEDIEVAL PHYSICS—Marshall Clagett—*Columbia University Press*, 182 p., \$2.50. This is a discussion of certain physical concepts of the 14th and 15th centuries and a study of a now little-known man who was regarded as an outstanding figure by his academic contemporaries.

Science News Letter, June 28, 1941

GEOGRAPHY—ECONOMICS

ECONOMIC GEOGRAPHY—Clarence Fielden Jones and Gordon Gerald Darkenwald—*Macmillan*, 629 p., \$4.25. A comprehensive college text which approaches the subject from the standpoint of industries, the world over. The pages are generously provided with maps, charts, graphs, and pictures, and the authors have met the difficult problem of what to do about statistics by presenting them mainly in the graphs and other material not a part of the text.

Science News Letter, June 28, 1941

